income. The Collector remarks, in connection with this matter, that "probably, as the relations between the Department and the villagers improve, wilful damage of this kind will tend to become less frequent," but that "it is impossible to propose special penalties unless a series of offences is clearly brought home to them." Unfortunately, if it is considered necessary to bring home to individuals the fires they have caused, a series of offences cannot be established, as the experience of several years shows. As regards the relations of the villagers to the Forest-Department, I do not think that they are bad, or that improvement can be looked for in that direction; it is quite natural that they should set fire to the jungles, as long as it is to their immediate interest to fire them and they can do so with impunity. Their object in firing the forest is (1) to induce an early and good crop of grass, (2) to kill trees and so open out the jungle and increase the crop of grass, (3) to obtain manure for their fields in the ash washed down from the forest and (4) to clear the ground for sporting purposes.

103. The following areas are estimated to have escaped fire without adoption of special measures:—

	Acres.
Northern Division, Kánara	507,345
Central Division, Kánara	400,467
Southern Division, Kánara	773,225
Belgaum	277,612
Dhárwár	239,598
Bijápur	127,455
Kolába	224,003
Ratnágiri	10,365
Total ...	2,560,070

104. The area reported as having escaped fire without the taking of special measures amounted to 3,982 square miles, or 74 per cent. of the whole area, during 1891-92. During the year under report, it amounted to 4,000 square miles, or 74·3 per cent. of the whole area.

105. *Northern Division of Kánara.*—In the Haliyál- and Supa-forests, protection is reported to have been very successful. Eleven fires took place in Haliyál, in one of which the offenders were traced. These fires were quickly extinguished, and only a small area was burnt. In Supa, 13 acres were burnt. The offender was prosecuted and fined Rs. 5. Three other fires also occurred, but no trace of the offenders could be found.

106. *Central Division of Kánara.*—The Divisional Officer reports that protection from fire in the Yellápur-and Mundgod-ranges was very successful, but that in Ankola a larger area was burnt than that burnt in 1891-92. The number of fires observed was 68. No offenders were traced.

107. *Southern Division of Kánara.*—In the reserved forests which were protected by fire-lines, 1,344 acres are said to have been burnt. The origin of the fires that occurred has in no case been discovered. The number of cases in which fire was brought to notice was 35.

108. *Belgaum.*—Here, fire-protection has, it is reported, been on the whole eminently successful, although the number of fires was 99 against 64 of the year before.

109. The great damage done in the fuel-reserves in the Khánápur range has already been alluded to.

110. *Dhárwár.*—The area protected was practically the same as that protected in the preceding year. In the specially-protected areas, about 5 square miles are shown to have been burnt. The Divisional Officer attributes the origin of the fires to carelessness on the part of travellers in throwing into the jungle lighted *bidis* and torches, but this cause cannot satisfactorily account for all the fires that occurred. The number of cases in which fires were discovered was 33. No offenders were detected.

111. *Bijápur.*—The closed forests of Bádámi and Bágalkot were specially protected. It is said that only 51 acres were burnt.

112. *Kolába.*—In Kolába, special protection appears to have been very satisfactory; the area attempted is not, however, large enough.

113. *Ratnágiri.*—Here the results were eminently satisfactory.

(3). *Regulation of Grazing and Protection from Cattle.*

114. Under the rules sanctioned in Government Resolution No. 3595, dated 23rd May, 1890, grazing is permitted in the unclosed portions of forest.

Villages which have contributed *gáirán* to the formation of a forest-block are allowed free grazing in the open forest of that block, for all their agricultural cattle. Other village-cattle belonging to cultivators are charged fees varying, according to species, from 1-8 annas a head. Double fees are charged for outside cattle, and to those belonging to professional graziers.

115. The above rules apply to all districts, excepting Kánara, where an uniform rate of 2 annas is charged on all cattle, belonging to villagers other than *gaulis*, that are grazed in open forests; one rupee a head is charged for cattle belonging to professional graziers, and to persons not residing in Kánara.

116. Appendix 54 gives details of areas closed to horned cattle and browsers, as well as those left open for grazing.

117. The area closed to all animals amounted to 700 square miles, to browsers to 762 square miles, and that open to all animals to 3,821 square miles.

118. It should, however, be noted that in the greater part of Kánara there are no browsers, although the forests have not been closed to them. The only browsers that prey on the forests of this circle are sheep and goats. It is satisfactory to see that the raising of the fee for grazing sheep and goats in the Parasgad-táluka of the Belgaum-Division has reduced the number of these animals grazed in the forests from 74,155 to 35,582 without giving rise to complaints. Inám-forests and those belonging to Native States, which are dotted over the Belgaum-district, afford a means to our villagers of providing their browsers with cheaper grazing than that now available in the Government-forests of that district.

119. The area, closed to grazing in 1891-92, was 454.96 square miles. During that year, large areas were thrown open owing to the prevailing scarcity of fodder in the plain-districts.

120. From experience of the general famine in 1876, and the fodder-famine in 1891, I consider that, in times of scarcity, very little good is gained by opening closed areas to cattle in these districts. In the dry zone, whenever the rain is insufficient to produce agricultural crops, it is also insufficient to produce grass-crops, and during the cold and hot months the dried-up leaves of trees in the forest are useless as fodder. In the moist zone, a fodder-famine never occurs, but on the occurrence of one in the Eastern districts, cattle are sooner or later sent west in search of grazing grounds. They are generally in a very debilitated state on arrival in Kánara, and die like flies, and those that do survive a short time are hurried back to their own country before the scarcity has disappeared. The damage done by the influx of thousands of cattle into the jardin-aged forests of Kánara is of course considerable, and of doubtful utility considering the small benefit, if any, derived by their owners from the concession. The latter have a great dread of sending their animals to Kánara and put off sending them there until they have become so starved as to be unable to undergo the fatigues of a long march. For this reason, probably, many of the animals succumb to contagious disease, which is communicated to the local cattle.

121. It may, therefore, be doubted if life is really saved by the opening of closed areas in time of famine, while it is certain that much damage is thereby caused in the famine-tract by the eradication of all the good that has occurred to the forests closed for several years preceding the scarcity. It even seems probable that the effect, if any, of opening closed areas in a famine-year is the reverse of that desired, as the concession may have a tendency to induce owners to put off sending their cattle to better grazing-grounds until the animals are too weak to stand the journey and the altered conditions of climate and fodder in the moist zone. If cattle are sent to the moist zone, they should be sent there not later than the beginning of September.

122. The number of animals impounded during the period under report and during the previous year in open and closed forests, is given below :—

Division.	Number of Animals impounded during 1891-92.			Number of Animals impounded during 1892-93.		
	In open forests.	In closed forests.	Total.	In open forests.	In closed forests.	Total.
Northern Division, Kánara ...	...	173	173	...	207	207
Central Division, Kánara ...	346	194	540	129	417	546
Southern Division, Kánara ...	121	122	243	76	43	119
Belgaum	1,892	1,239	3,131	3,178	1,750	4,928
Dhárwár	686	1,680	2,366	...	...	...
Bijápur	1,279	...	1,279	...	...	...
Kolába	...	763	763	593	...	593
Ratnágiri	119	112	231	...	372	372
Total ...	4,443	4,283	8,726	3,976	2,789	6,765

123. The table shows a considerable increase of impoundings in Belgaum. The small number in the previous year was, however, due to the fact that the forests of Gokák and Parasgad were opened to free-grazing on account of the fodder scarcity of 1891-92, and the number of cattle impounded during that year fell, in consequence, in much the same ratio, in regard to the number impounded during 1890-91, as that in which it rose in 1892-93, as compared with the figures for 1891-92. The number of cattle impounded during 1892-93 was, in fact, less than that reported for 1890-91.

(*c*). Improvement of Forest-Growth.

(*1*). *Natural Reproduction.*

I.—By Seed and II.—By Coppice.

124. *Northern Division of Kánara.*—The Divisional Officer reports that natural reproduction in teak- and blackwood-forests has continued good, but that teak is more backward in reproduction by seed than other species. This is to be expected, and the comparatively-slow natural reproduction of teak from seed will have to be made up for artificially. Mr. Talbot remarked that teak-seedlings were plentiful in the forest in the neighbourhood of the Kátnál, Birchi and Kálánadi streams.

125. The reproduction from stools in the firewood-*coupes* was good.

126. *Central Division of Kánara.*—The Divisional Officer's report affords but little information. He refers to some areas in the Yellápúr-Range in which the reproduction of teak and blackwood was particularly good. In the timber-forests of Yellápur, which have been protected from fire, natural reproduction by seed of teak and other superior species is very satisfactory.

127. *Southern Division of Kánara.*—In the specially-protected forests some signs of natural reproduction by seed were noticed, and teak-seedlings are said to be plentiful in the Bilki-forests, but, generally speaking, reproduction is bad in this Division. This is, in a great measure, owing to the numerous *supári*-gardens and *rán*-lands by which the forests are intersected throughout the greater part of the Division, and which render regeneration and protection from fire very difficult.

128. *Belgaum.*—The reproduction by seed of teak is reported to be satisfactory in the Nágargárli and Kirpoli forests, areas to which teak-seedling-forest is practically confined.

129. In fuel-cuttings, the trees coppice excellently, but have been greatly damaged by fires.

130. In the area (300 acres) fenced in at Hemadge (moist zone) good progress in natural reproduction by seed is noticeable.

131. In the 1,412 acres of scrub jungle at Konnúr in Gokák (dry zone), which were closed two years ago, the improvement from closure is reported to be most marked. Mr. Murray further reports that, whereas in such forests artificial reproduction is expensive and generally unsuccessful, closure is cheaper and successful.

132. *Dhárwár.*—The Divisional Officer reports that, in the cuttings, the reproduction from stools is satisfactory, but that reproduction from seed is very backward.

133. *Bijápur.*—Mr. Bell, who only took charge of the Division last June, reports that the stools, in the Shivpur cutting of last year, are reproducing satisfactorily. Owing to the extreme dryness of the climate, the great demands on the forest, and the difficulty of protection, natural reproduction by seed is very bad.